

aspect thereof;

a second illumination source disposed for illuminating the gemstone from a second aspect thereof;

electronic camera means for viewing a the gemstone and for generating a first electronic signals signal corresponding to a first physical characteristic of the gemstone when illuminated by said first illuminating source and for generating a second electronic signal corresponding to a second physical characteristic of the gemstone when illuminated by said second illuminating source;

electronic data processor means operatively connected to said electronic camera for receiving the electronic signals, for controlling the operation of said electronic camera to generate electronic signals corresponding to at least two different physical characteristics of the gemstone, and for analyzing the electronic signals to provide data files containing information identifying said at least two different first and second physical characteristics of the gemstone;

data storage means operatively connected to said electronic data processor means for storing the information identifying the first and second physical characteristics in a database of gemstone identifying information for a plurality of known gemstones; and

means for comparing the identifying information of the viewed gemstone provided by said electronic data processor with the identifying information of a known gemstone retrieved from said data storage device so that the gemstone viewed by the electronic camera means can be accurately identified from said database of gemstone identifying information.

43.(Currently Amended) A system as set forth in Claim 42 comprising means for illuminating the gemstone and wherein the electronic data processor means comprises light control means for controlling the first and second illumination sources of the gemstone by said illuminating means to illuminate the gemstone with one or both of the first and second illumination sources.

44.(Previously Added) A system as set forth in Claim 43 further comprising means for displacing the gemstone relative to said electronic camera means and wherein the electronic data processor means comprises means for controlling said electronic camera and said displacing means for capturing a profile image and a color image of the gemstone viewed by said electronic camera means.

45.(Previously Added) A system as set forth in Claim 44 comprising means for capturing multiple profile and color images of the gemstone by said electronic camera means.

46.(Previously Added) A system as set forth in Claim 43 further comprising means for capturing a fluorescence image of the gemstone with said electronic camera means.

47.(Previously Added) A system as set forth in Claim 43 further comprising means for displacing the gemstone relative to said electronic camera means and wherein the electronic data processor means comprises means for controlling said electronic camera means and said displacing means for capturing a brilliance and scintillation image of the gemstone with said electronic camera means.

48.(Previously Added) A system as set forth in Claim 47 further comprising

means for capturing a girdle image of the gemstone with said electronic camera means.

49.(Previously Added) A system as set forth in Claim 47 further comprising means for capturing a table and luster image with said electronic camera means.

50.(Previously Added) A system as set forth in Claim 43 further comprising means for capturing a laser scatter image of the gemstone with said electronic camera means.

51.(Previously Added) A system as set forth in Claim 47 further comprising means for capturing a culet image of the gemstone with said electronic camera means.

52.(Previously Added) A system as set forth in Claim 47 further comprising means for capturing a table facet image of the gemstone with said electronic camera means.

53.(Previously Added) A system as set forth in Claim 47 further comprising means for capturing a surface feature image of the gemstone with said electronic camera means.

54.(New) Apparatus for color measurement of a diamond comprising:
a daylight-approximating light source;
a surface for accommodating a diamond;
a light detector positioned to detect light from said light source coming out at a specific angle from the pavilion facets of a table-down diamond, when such diamond is accommodated by said surface, said light detector; and
an optical measurement device for measuring light detected by said light

detector.

55.(New) The diamond color measurement apparatus of Claim 54 wherein said light detector is positioned so as to detect light directly coming from the pavilion facets of a table-down diamond at an angle of zero degrees relative to the table of the table-down diamond, when such a diamond is accommodated by said surface.

56.(New) The diamond color measurement apparatus of Claim 54 wherein said surface comprises a platform.

57.(New) The diamond color measurement apparatus of Claim 54 wherein said surface comprises a rotor platform.

58.(New) The diamond color measurement apparatus of Claim 54 wherein said surface comprises a rotor platform capable of rotating through a plurality of preset intervals.

59.(New) The diamond color measurement apparatus of Claim 54 wherein said surface comprises a rotor platform and a rotor which may be set to permit measurement by said optical measurement device during a rotation of said rotor platform.

60.(New) A diamond color measurement apparatus comprising:
a daylight-approximating light source;
a surface for accommodating a diamond;
a light detector positioned to detect light from the light source coming directly from the pavilion facets of a table-down diamond on the surface; and
an optical measurement device for measuring light detected by the light

detector.

61.(New) The diamond color measurement apparatus of Claim 60 wherein said light detector is positioned so as to detect light directly coming from the pavilion facets of a table-down diamond at an angle of zero degrees relative to the table of a table-down diamond, when such a diamond is accommodated by said surface.

62.(New) The diamond color measurement apparatus of Claim 60 wherein said surface comprises a platform.

63.(New) The diamond color measurement apparatus of Claim 60 wherein said surface comprises a rotor platform.

64.(New) The diamond color measurement apparatus of Claim 60 wherein said surface comprises a rotor platform capable of rotating through a plurality of preset intervals.

65.(New) The diamond color measurement apparatus of Claim 60 wherein said surface comprises a rotor platform and a rotor which may be set to permit measurement by said optical measurement device during a rotation of said rotor platform.

66.(New) A system for diamond color measurement comprising:
a surface for accommodating a diamond;
a daylight-approximating illumination source for illuminating a diamond when the diamond is accommodated by said surface;
a light detector positioned to detect light coming out at a specific angle from the pavilion facets of a table-down diamond when the diamond is accommodated by said

surface; and

an optical measurement device for measuring light detected by said light detector.

67.(New) The system for diamond color measurement of Claim 66 further comprising an optical analysis mechanism for processing measurements measured by said optical measurement device.

68.(New) The system for diamond color measurement of Claim 66 wherein said surface comprises a rotor platform.

69.(New) The system for diamond color measurement of Claim 66 wherein said light detector is positioned so as to detect light coming directly from the pavilion facets of a table-down diamond at an angle of zero degrees relative to the table of a table-down diamond when such a diamond is accommodated by said surface.

70.(New) A system for diamond color measurement comprising:

- a surface for accommodating a diamond;
- a daylight approximating illumination source illuminating a diamond accommodated by said surface;
- a light detector positioned to detect light coming directly from the pavilion facets of a table-down diamond accommodated by said surface; and
- an optical measurement device for measuring light detected by said light detector.

71.(New) The system for diamond color measurement of Claim 70 further comprising an optical analysis mechanism for processing measurements measured by

said optical measurement device.

72.(New) The system for diamond color measurement of Claim 70 wherein said surface comprises a rotor platform.

73.(New) The system for diamond color measurement of Claim 70 wherein said light detector is positioned so as to detect light coming directly from the pavilion facets of a table-down diamond at an angle of zero degrees relative to the table of a table-down diamond when such a diamond is accommodated by said surface.

74.(New) A method of analyzing the color of a diamond comprising the steps of:
 illuminating a table-down diamond with a daylight-approximating light source;
 detecting the light from the light source coming out at a specific angle from the pavilion facets of the diamond;
 measuring the detected light with an optical measurement device; and
 analyzing the measurements with an optical analysis device.

75.(New) The method of analyzing the color of a diamond of Claim 74 wherein said step of detecting comprises detecting light coming out of the pavilion facets of the diamond at an angle of zero degrees relative to the table of the diamond.

76.(New) The method of analyzing the color of a diamond of Claim 74 further comprising the step of rotating said table-down diamond during said detecting step.

77.(New) The method of analyzing the color of a diamond of Claim 74 further comprising the step of rotating said table-down diamond through a plurality of preset intervals during said detecting step.